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(54) Door mounting arrangement

(57) A door mounting arrangement for a circular door, for example for a washing machine, in which the door (1) is formed adjacent its edge with an annular axially-projecting flange (2), and there is provided at least one mounting block (4, 16) having an arcuate groove (8, 18) which accommodates a region of the flange and means (5, 6, 19, 20) for clamping the flange to the door. A pair of mounting blocks can provide a connection for a hinge bracket (9) or a single block (16) may carry a closure element (17) the invention enabling such members to be mounted on the door without the need for drilling or piercing the door, or for providing a separate mounting frame, and is thus of particular advantage in the case of glass doors.

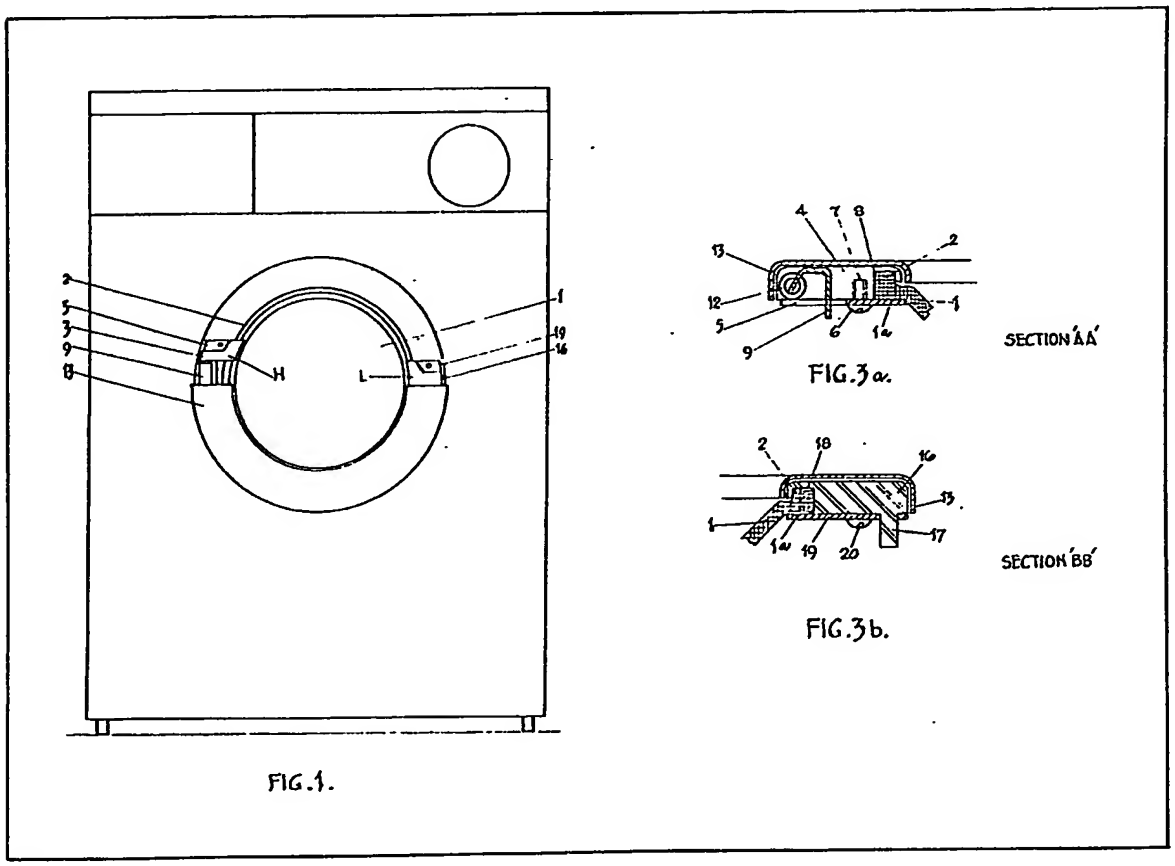

FIG.1.

FIG.3a.

FIG.3b.

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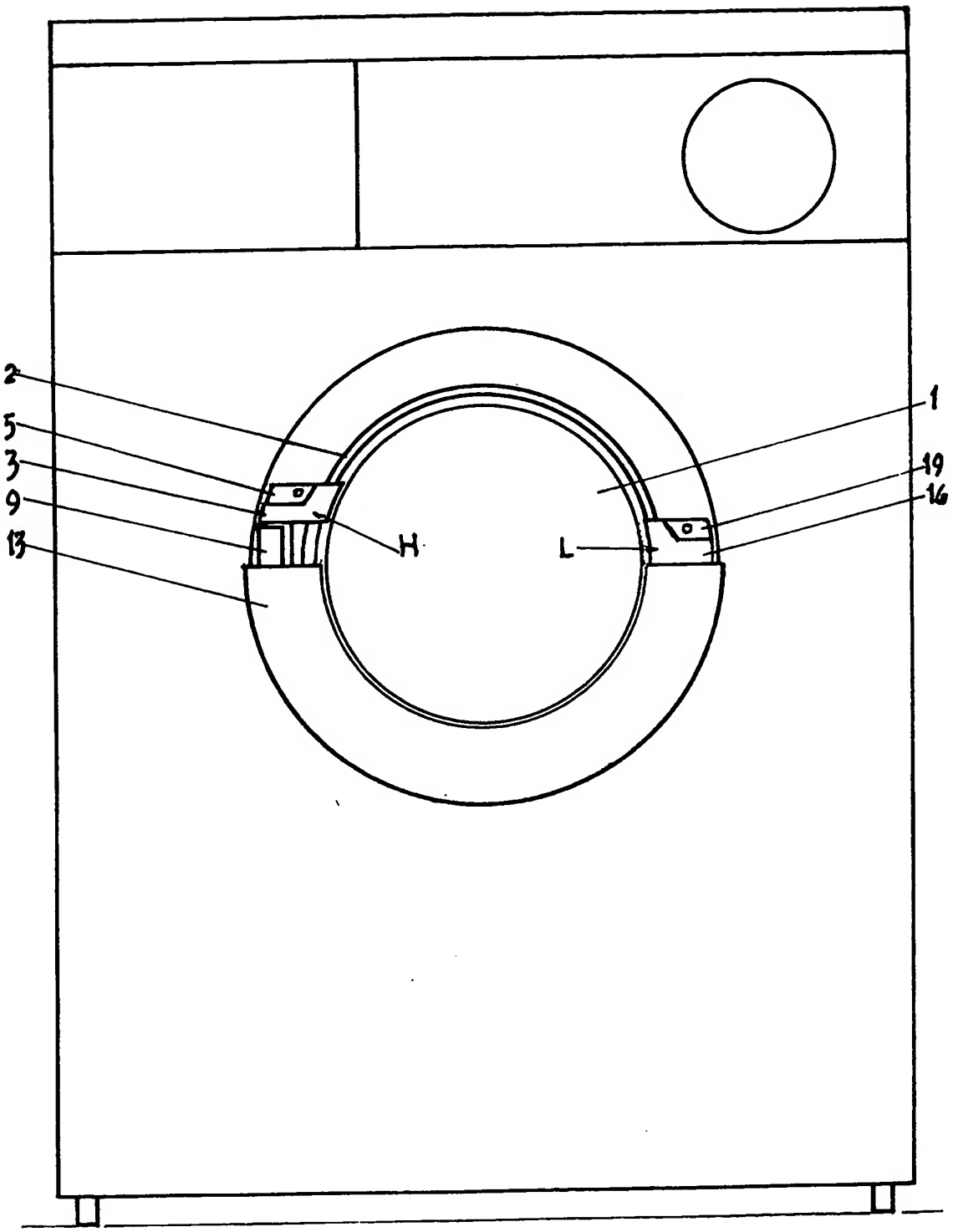


FIG.1.

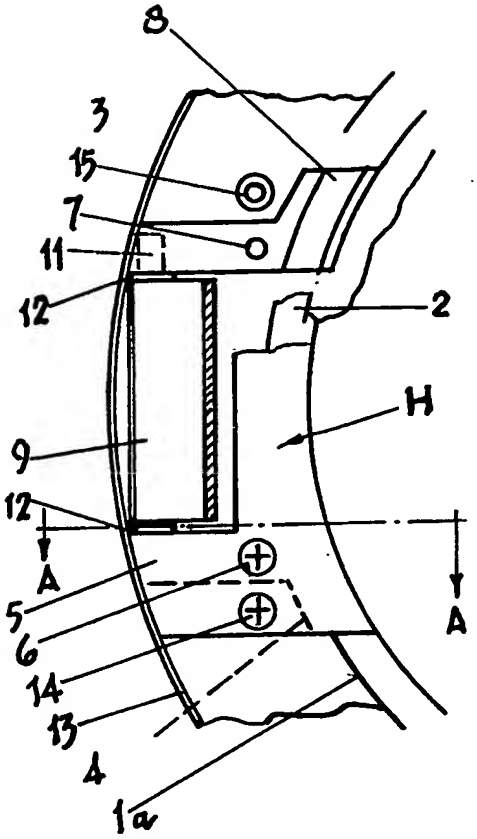


FIG.2a.

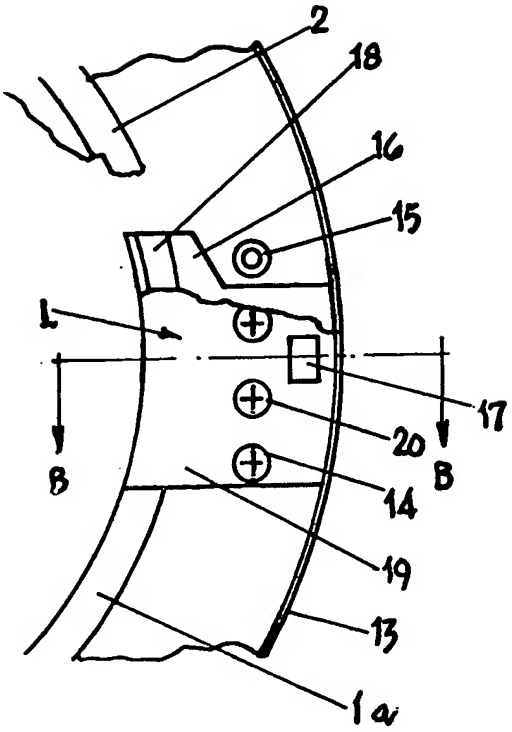
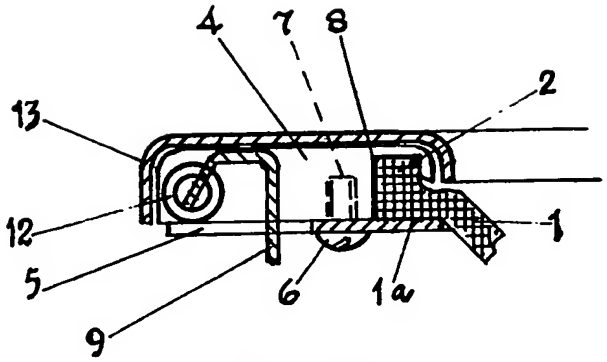
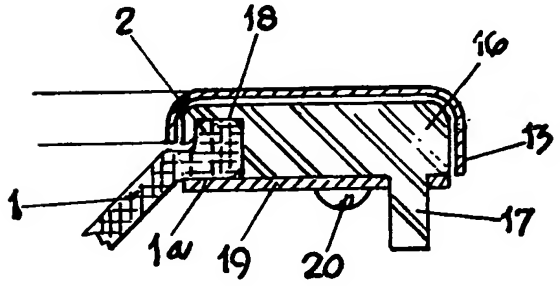


FIG.2b.



SECTION ÁA´

FIG.3a.



SECTION ´BB´

FIG.3b.

SPECIFICATION

Door mounting arrangement

This invention relates to door mounting arrangements, and is especially, though not exclusively, concerned with mounting arrangements for circular doors as are used in washing machines and tumble dryers.

Such washing machine doors are commonly of glass material in order to withstand the effects of the temperature conditions and modern detergents, but suffer from the disadvantage that they cannot conveniently be drilled or formed for the attachment of e.g. hinging details. Normally the door is fitted by clamping or other suitable means into a reasonably substantial frame to which parts are attached to hinge the door and to latch it in the closed position. One solution to this problem is to mould the door in a suitable thermoplastics material which can be shaped as required to readily attach the necessary parts. These materials, however, are either less suitable regarding temperature or chemical resistance, or more expensive than glass.

An object of the invention is to provide a door mounting arrangement suitable for a glass door which can be fitted without the need for drilling or otherwise piercing the glass, and avoids the need for a mounting frame.

According to the invention in a door mounting arrangement for a circular door, the door has, at or near its periphery, an annular axially-projecting flange, and there is provided at least one mounting block having an arcuate groove which accommodates a region of the flange, and a clamping member capable of attachment to the block and engageable with a surface of the door opposed to the flange so as to clamp the block to the door and retain the flange within the groove.

A mounting block/clamping member assembly can be of any convenient material to which a hinge or closure element, as the case may be, can be attached, the arrangement having the advantage that, when used with a glass door, the need for a substantial mounting frame is avoided, and at the same time, since the assembly can be rotationally orientated with respect to the door, there is no necessity to form the door with a unique mounting position for the mounting arrangement or to provide holes in the glass to enable the mounting arrangement to be secured thereto.

Conveniently a mounting arrangement in accordance with the invention for co-operating with a hinge comprises a pair of said mounting blocks securable to the door in circumferentially spaced relationship by a single common clamping member, the opposed faces of the blocks being recessed, and accommodating aligned bearing bushes into which tabs or pins of a hinge bracket extend, such that the door can rotate with respect to the hinge bracket about the common axis of the bearing bushes. In use the bearing bracket is arranged to be secured to a cabinet, for example a washing machine cabinet, having a door opening such that the door opening can be opened or closed by the door, by pivoting the door about the hinge bracket.

Instead of the mounting blocks accommodating bearing bushes they may themselves carry opposed pins or tabs which project into co-operating bearing openings in the hinge bracket.

The shape of the hinge bracket in either case is conveniently such that the door can be swung through an angle of 180° between the fully closed and fully open positions.

In the case of a mounting arrangement for a closure element, a single mounting block may be employed, the closure element being secured to the mounting block/clamping member assembly and being arranged to engage a co-operating closure element attached to the edge of an opening which is closeable by the door, for securing the door in the closed position, means being provided for disengaging the closure elements to enable the door to be opened.

One embodiment of the invention as applied to the galss door of a front loading type washing machine will now be described by way of example with reference to Figures 1 to 3 of the accompanying schematic drawings, in which

Figure 1 is a front elevation of the washing machine with part of the door frame cover removed,

Figures 2a and 2b show door mounting arrangements in accordance with the invention for a hinge and a catch element of the door respectively viewed from the rear of the door, and

Figures 3a and 3b show sectional views of the door mounting arrangements of Figures 2a and 2b along the lines AA and BB respectively.

Referring first to Figure 1 this represents a front elevation of a washing machine having a front loading opening closed by a circular dished glass door 1 formed of a suitable heat-resisting glass such as a borosilicate glass. The edge of the door is furnished with a continuous axially-projecting flange 2 by which the door is clamped and thereby supported in a pivotable manner using an attachable hinging assembly H. The flange 2 also carries a door latching assembly L.

The hinging assembly H comprises two mounting blocks 3 and 4 and a common clamping plate 5 with two fixing screws 6. Each mounting block is provided with an arcuate groove 8 enabling it to be located over the door flange 2 and secured to the edge of the door in conjunction with the other mounting block by the clamping plate 5 which rests against the flat (inner) surface 1a of the door rim, the screws 6 passing through holes in the clamping plate into respective tapped holes 7 in the mounting blocks 3, 4. Use of the clamping plate 5 enables circumferential spacing of the mounting blocks 3 and 4 to be controlled, whilst the grooves 8 and the flange 2 ensure an accurate radial location of the blocks. Hinging of the door is achieved by means of a hinge bracket 9 having two oppositely arranged tabs (or having fitted pins, not shown), each of which is capable of securement in bushes 12 rotatably mounted in

holes 11 provided in the opposed faces of the mounting blocks 3 and 4. Thus the door is capable of swinging movement through 180° from its closed to its fully open position.

The latching assembly L for securing the door in its closed position comprises a latch mounting block 16 having a groove 18 similar to that of the hinge mounting blocks 3 and 4 enabling it to be mounted about the door flange 2 in conjunction with a clamping plate 19 and two fixing screws 20, the latching assembly L being arranged diametrically opposite the hinge assembly H. The latch mounting block houses a latching device 17 for securing the door in its closed position, the latch engaging a mating aperture in a co-operating element, (not shown) mounted on the front panel of the washing machine adjacent the edge of the door opening. The latch 17 is arranged to operate on a horizontal edge of the mating aperture allowing it to take up any diametral tolerances in the door and its mounting.

An annular decorative trim 13 may be attached to clamping plates 5 and 19 by screws 14 engaging in bosses 15 forming part of the inside of the trim 13.

The mounting blocks 3, 4 and 16 are relatively small compared with the more usual annular designs and may be formed of cast metal or suitable moulded plastics material. In the former case it may be desirable to insert a suitable buffer material between the blocks and the glass door to avoid local pressure concentration which could initiate cracks. An important advantage of the construction according to the invention is that the glass door, having no local fixing points and being of regular section around its circumference may be assembled in any rotational orientation.

Moreover since the trim 13 serves only as an appearance item and has no structural function it may be made from very light and hence cheap material, e.g. thin plastic moulding or alloy die casting or pressed metal, suitably finished. Indeed it is envisaged that the trim, in a purely functional design of washing machine, may be dispensed with altogether.

CLAIMS

1. A door mounting arrangement for a circular door, wherein the door has, at or near its periphery, an annular axially-projecting flange, and there is provided at least one mounting block having an arcuate groove which accommodates a region of the flange, and a clamping member capable of attachment to the block and engageable with a surface of the door opposed to the flange so as to clamp the block to the door and retain the flange within the groove.

2. A mounting arrangement according to Claim 1 for co-operating with a hinge, comprising a pair of said mounting blocks securable to the door in circumferentially spaced relationship by a single common clamping member, the opposed faces of the blocks being recessed, and accommodating aligned bearing bushes into which tabs or pins of a hinge bracket extend, such that the door can rotate with respect to the hinge bracket about the common axis of the bearing bushes.

3. A mounting arrangement according to Claim 1 for co-operating with a hinge, comprising a pair of said mounting blocks securable to the door in circumferentially spaced relationship by a single common clamping member, the opposed faces of the blocks carrying opposed pins or tabs which project into co-operating bearing openings in a hinge bracket such that the door can rotate with respect to the hinge bracket about the common axis of the bearing bushes.

4. A mounting arrangement according to Claim 2 or 3 wherein the shape of the hinge bracket is such that the door can be swung through an angle of 180° between the fully closed and fully open positions.

5. A mounting arrangement according to Claim 1 wherein the mounting block/clamping member assembly has secured to it a closure element for engaging with a co-operating closure element attached to the edge of an opening, which is closeable by the door, for securing the door in the closed position.

6. A washing machine incorporating a circular glass door having a mounting arrangement in accordance with any preceding claim.

7. A washing machine according to Claim 6 wherein the door is formed of glass.

8. A mounting arrangement for a glass door of a front loader type washing machine substantially as shown in and as hereinbefore described with reference to Figures 1 to 3 of the accompanying drawings.

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